

Claims

1. Integrated chromatic dispersion compensator for optical signals in optical communication networks, comprising a plurality of cascaded stages of optical dispersion elements arranged in the form of a lattice filter structure, wherein

at least one tapping device disposed between consecutive stages of the optical dispersion elements for tapping inter stage signals, feeding each tapped inter stage signal into a separate feedback loop, which in turn is feeding adaptation parameters into at least one of the stages of the optical dispersion elements preceding the corresponding tapping device of the inter stage signal.
2. Integrated chromatic dispersion compensator according to claim 1, wherein the integrated chromatic dispersion compensator comprises a plurality of tapping devices disposed between several stages of the optical dispersion elements for tapping inter stage signals.
3. Integrated chromatic dispersion compensator according to claim 1, wherein the stages of the optical dispersion elements comprises tuneable phaseshifters, in particular electrically and/or thermally tuneable phaseshifters.
4. Integrated chromatic dispersion compensator according to claim 3, wherein each feedback loop controls only one single phaseshifter, preferably a

phaseshifter which is arranged in parallel to or in series with a delay element.

5. Integrated chromatic dispersion compensator according to claim 1, wherein a further tapping device for tapping the output signal of the lattice filter structure, and feeding the tapped output signal in an additional feedback loop, and feeding adaptation parameters derived by the additional feedback loop into at least one of the stages of the optical dispersion elements preceding the further tapping device.
6. Integrated chromatic dispersion compensator according to claim 1, wherein one or more of the cascaded stages of the optical dispersion elements comprise a Mach-Zehnder interferometer.
7. Method for operating an integrated chromatic dispersion compensator according to claim 5, wherein the additional feedback loop is adjusted to maximize the average optical power of the output signal of the lattice filter structure.
8. Method for operating an integrated chromatic dispersion compensator according to claim 1, wherein the adaptation parameters are chosen in order to either maximize or minimize the average optical power of the corresponding tapped interstage signal, or to set the tapped interstage signal to a pre-selected level.
9. Method for operating an integrated chromatic dispersion compensator according to claim 1, wherein two interstage signals between two consecutive stages of optical dispersion elements are tapped from different parallel waveguides of the lattice filter structure, that the difference of the average optical power of said two tapped interstage signals is either

maximized or minimized, or set to a pre-selected level.

10. Method for operating an integrated chromatic dispersion compensator according to claim 1, wherein the stages of the optical dispersion elements not controlled by a feedback loop (8, 15) are controlled by an additional adaptation control device (24) optimizing a quality signal derived from the output signal of the lattice filter structure.
11. Method for operating an integrated chromatic dispersion compensator according to claim 1, wherein the stages of the optical dispersion elements not controlled by a feedback loop are controlled by an accessory control device, that a dispersion analyzer determines the amount of dispersion which has distorted the input signal of the lattice filter structure, and that the data determined by the dispersion analyzer is evaluated by the accessory control device for controlling the stages of the optical dispersion elements not controlled by a feedback loop.